

**The Reach and Impact of Social Marketing and
Reproductive Health Communication Campaigns
in Tanzania**

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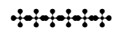
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Abstract

Objectives: In Tanzania, governmental and non-governmental organizations are increasingly relying on health education and communications to provide information about reproductive health and HIV/AIDS prevention and to promote healthy behavior, including condom use, abstinence, and partner reductions. This paper studies the reach of the *Green Star* family planning program, six different radio drama series, and the *Salama* condom social marketing campaign in Tanzania. In addition, it assesses the impact these programs have on discussion of family planning and condom use.

Data: The 1999 Tanzania Reproductive and Child Health Survey containing a sample of 4,029 women (age 15–49) and 3,542 men (age 15–59) was used for this analysis.

Results: Results show that 42% of women and 53% of men were exposed to both the social marketing and other reproductive health communication campaigns. For both genders the likelihood of being exposed to campaigns was higher among educated urban dwellers with access to the media. Estimates of the impact of campaign exposure show that for both men and women exposure to the *Salama* campaign, the reproductive health dramas, and the *Green Star* program had a significant positive effect on discussion of family planning and ever-use of condoms. Exposure to any of the campaigns also had a positive effect on the likelihood of having used a condom in the last sex act for men (OR=1.1 for drama exposure, OR=1.3 for *Salama* exposure, and OR=1.2 for *Green Star* exposure); however, only the *Salama* campaign had a significant effect on women's use of condoms at last sex act (OR=1.2).

Conclusions: The three types of programs discussed in this paper succeeded in reaching substantial portions of the population. Yet further efforts must be made to reach rural, less educated and low socio-economic status populations. To a large extent the programs reached similar audiences, thereby reinforcing the messages. Exposure to the campaigns had a positive effect on discussion of family planning and condom use. As this effect increased with level of exposure, it is important for future campaigns to increase the number of channels through which they disseminate campaign messages and to increase the frequency of such messages.

The Reach and Impact of Social Marketing and Reproductive Health Communication Campaigns in Tanzania

Introduction

In Tanzania, as in many developing countries, governmental and non-governmental organizations are increasingly relying on social marketing and health communication programs to provide information about reproductive health and HIV/AIDS prevention and to promote healthy behavior, including condom use, abstinence, and partner reductions (Communication Initiative, 2003a; Communication Initiative, 2003b; Jato, et al., 1999; Population Services International [PSI], 2003). In response to the growing importance of social marketing and health communication programs worldwide, the Demographic and Health Survey program has started to include questions on exposure to such programs in selected surveys, including Tanzania. The purpose of this paper is to assess the reach of selected social marketing and health communication activities in Tanzania and to assess their impact on discussion of family planning and on condom use.

Background

Reproductive Health

The low user-prevalence of modern contraceptives in Tanzania has remained at 16.6% for married women and 23% for married men. The total fertility rate has declined only modestly, from 6.5 children per woman in 1988 to 5.8 in 1996 and 5.6 in 1999

(National Bureau of Statistics [Tanzania] & Macro International Inc., 2000; USAID, 2003).

Tanzanian youth are particularly vulnerable to reproductive health problems. Sexual debut is early, and short courtships and risky sexual activity are common. The median age at first intercourse is 16.6 years for females and 17.9 for males. Childbearing also begins early. The median age at first birth is approximately 19 years, and a quarter of women aged 15–19 are mothers or pregnant with their first child (National Bureau of Statistics [Tanzania] & Macro International Inc., 2000; Nuko, Chiduo, Mwaluko, & Urassa, 2001; Maswanya, et al., 1999; Mwakagile, et al., 2001). Early pregnancy can have severe social and economic implications because pregnant schoolgirls are expelled (UNICEF, 2003). Because of the early age of pregnancy for girls in Tanzania, unwanted pregnancies and illegal abortions pose a major health problem (Rasch, Silberschmidt, Mchumvu, & Mmary, 2000).

HIV/AIDS

At present, the adult HIV prevalence rate in Tanzania is approximately 7.8%; nearly 3 million Tanzanians are HIV+ (USAID, 2003). The epidemic is rapidly spreading and is driven mostly by high-risk heterosexual behavior and high levels of STI infection. AIDS has been the main cause of death among adults aged 15–59 since 1999 (Deutsche Gesellschaft für Technische Zusammenarbeit [GTZ], 2002). The groups most affected by HIV/AIDS include high-risk groups such as commercial sex workers, truck drivers, and youth. In urban areas, more than 60% of female sex workers are HIV+ (Changalucha, Gavyole, Grosskurth, Hayes, & Mabey, 2002; Project Inform, 2000). Youth aged 15–24

account for 60% of the new HIV infections (USAID, 2002). A recent study of secondary school students and out-of-school youth aged 15–19 in Dar es Salaam showed that 60% were HIV+.

Despite the growing HIV prevalence and the fact that 92% of women aged 15–49 and 96% of men aged 15–59 know about condoms, actual levels of condom use have remained low. Only 16% of women and 37% of men reported using a condom during last intercourse (National Bureau of Statistics [Tanzania] & Macro International Inc., 2000).

Social Marketing and Reproductive Health Communication Programs

Since the 1980s, governmental and non-governmental organizations (NGOs) have designed and implemented various communication programs to address these reproductive health problems and to control the spread of HIV. Today, numerous reproductive health and HIV/AIDS programs implemented by the private, public, and voluntary sectors aim to reach the general population (often targeting adolescents and other high-risk groups).

Mass media and interpersonal communication campaigns are used to encourage contraceptive use and to prevent HIV infection by promoting safer sexual behavior and condom use. In 1993, a national family planning campaign, *Green Star*, was introduced to promote the use of family planning. The *Green Star* logo identified sites where family planning products and services are available, and *Green Star* promotional messages were disseminated through print, electronic media, and live dramas. The campaign initially started in only four locations but was expanded to all regional headquarters by 1995–

1996 and continues today (Jato et al., 1999; National Bureau of Statistics [Tanzania] & Macro International Inc., 2000).

Reproductive health messages are also disseminated through a number of radio drama series, several of which are implemented by the Ministry of Health. Broadcasting of the entertainment-education radio soap opera *Twende na Wakati* (*Let's Move with the Times*) on the national radio station *Radio Tanzania Dar es Salaam* began in July 1993. The program was broadcast nationwide in Swahili twice weekly and aimed to change attitudes toward family planning while also providing information about HIV/AIDS. Exposure to the soap opera is said to have resulted in increased self-efficacy, spousal communication about contraception, and use of family planning, while also reducing the number of sexual partners (Communication Initiative, 2003a; Mziray, 2002; Population Coalition, 2003; Rogers et al., 1999; Vaughan, Rogers, Singhal, & Swalehe, 2000). In October 1993, Radio Tanzania Dar es Salaam also started broadcasting *Zinduka!* (*Wake Up!*), an entertainment-educational radio soap opera on family planning. *Zinduka!* comprised 52 episodes and addressed the difficulties of a head of household caring for a large family (Communication Initiative, 2003b; Jato et al., 1999). More recently other radio dramas on reproductive health, including family planning and HIV/AIDS, have targeted youth. These dramas include *Vijana Wetu* and *Sema Naye* (National Bureau of Statistics [Tanzania] & Macro International Inc., 2000).

The Tanzania Social Marketing Program, an affiliate of Population Services International (PSI), distributes affordable (subsidized) condoms, female condoms, and oral contraceptives and promotes their use through an intensive mass media and interpersonal communication campaign. Distribution of *Salama* brand condoms started in

1993. *Salama* (which means “Safe”) condoms are distributed nationwide through a wide variety of outlets, including pharmacies, kiosks, grocery stores, barbershops, bars, guesthouses, brothels, and truck stops (Population Services International [PSI], 2003). At present, Tanzanians use 50 million condoms annually (BBC News, 2002). In 1998, PSI launched the *care* female condom program in Dar es Salaam. Like *Salama*, *care* female condoms are distributed through both the formal and informal sectors. It is estimated that *care* female condoms are available in 90% of pharmacies in the capital and other urban areas. Use of the female condom is promoted to CSWs at bars, brothels, and guesthouses (Agha & Van Rossem, 2002; Population Services International (PSI), 2003).

PSI uses innovative mass media campaigns, ranging from billboards to nationally aired television advertisements, to increase AIDS awareness and to promote the *Salama* brand. In rural areas where access to radio and television is limited, PSI uses Mobile Video Units to educate the population about STIs and HIV/AIDS prevention. Since 2001, PSI has added generic (non-branded) HIV prevention campaigns that emphasize that steady partners can also be a risk factor, address misconceptions about condoms, and talk about the risks associated with sugar-daddy and other cross-generational sexual relationships (Population Services International (PSI), 2003).

Since 2000, PSI has also been distributing *Safeplan* oral contraceptives through pharmacies, NGOs, private hospitals, dispensaries, and maternal and child health clinics. *Safeplan* and other oral contraceptives are promoted through a mass media campaign comprising radio, press, and print materials. The campaign educates the target population about the benefits of oral contraceptives and seeks to dispel misconceptions about side-effects of oral contraceptives.

In addition to these large-scale social marketing and health communication programs, there are several programs run by grassroots organizations. For example, *WATAMA* provides support to families affected by HIV/AIDS. *Doctors Without Borders* has launched an HIV/AIDS project for migrants and refugees in Nchengele District, where trained medical staff, counsellors, and volunteers are trained to disseminate accurate information about STIs and HIV/AIDS (Medecins Sans Frontieres, 2001).

Because young adults are vulnerable to HIV infection, several governmental and non-governmental programs specifically target youth. The current national policy on HIV/AIDS infection states that school-based HIV/AIDS and STI education should include information on condom use, but that condoms should not be distributed to schools because doing so would imply that the schools are encouraging sexual activity (Klepp, Ndeki, Leshabari, Hannan, & Lyimo, 1997). The ISH! campaign, which was launched in 2001, uses billboards, radio, television, newspapers, and community events to provide youth with critical HIV prevention information (USAID, 2003). One of the key campaign slogans directs youth to “Wait, or use a condom every time.”

The PSI social marketing campaign also includes several activities that specifically target youth. Since 1998, PSI had published *!AMUA*, a monthly youth-oriented newsletter that addresses reproductive health issues and includes letters from readers, games, and contests. The newsletter is distributed to more than 600 schools, youth centers, and other adolescent reproductive health programs. In addition, PSI broadcasts *Radio Amua!*, a radio program produced for and by youth, and the *Youth at Risk* television campaign, both of which address risk-perception of youth. Billboards for

the socially marketed *Salama* brand condoms also target youth who are or might become sexually active.

Data and Methods

Data

This study uses data from the 1999 Tanzania Reproductive and Child Health Survey (TRCHS), which contains information on a nationally representative sample of 4,029 women aged 15–49 and 3,542 men aged 15–59 (National Bureau of Statistics [Tanzania] & Macro International Inc., 2000). The survey was designed to gain information on a wide range of health topics, including mass media exposure, fertility, family planning, HIV/AIDS, and other sexually transmitted diseases.

In addition to the standard question modules, the TRCHS included questions on exposure to several social marketing and health communication campaigns. Specifically, respondents were asked about their sources of information about the *Green Star* family planning program and about their sources of exposure to family planning information in the previous six months. The survey also asked respondents whether they listened to any of six different radio drama series in the previous six months (*Zinduka*, *Twende na Wakati*, *Geuza Mwendu*, *Ukimwi Kifo*, *Sema Naye*, and *Vijana wetu*). If so, they were asked how frequently they listened to each series. Finally, respondents were asked whether they heard or saw any message about the socially marketed *Salama* condoms in the previous six months and if so, where they heard or saw these messages.

The male and female surveys were conducted using a three-stage sample design. In the first stage, 176 census enumeration areas were selected from the 357 sample points

that had been used in the 1996 Tanzania Demographic and Health Survey. Enumeration areas on the mainland were chosen using probability proportional to size on a roughly self-weighting basis with oversampling of urban areas and Zanzibar. Our analyses are weighted to correct for this oversampling. All households in the selected enumeration areas were listed, and households were randomly selected from those lists. All females aged 15–49 and males 15–59 in the selected households were eligible for interviewing. Fieldwork was conducted from September through November of 1999.

As anticipated, the samples had a very young age distribution, with 42.7% of females and 37.5% of males under 25 years old. Just over a quarter (27.9% of females and 26.6% of males) lived in urban areas. Levels of education were low. While 46.3% of females and 50.6% of males had completed primary school, only 5.3% and 7.2%, respectively, had attended secondary school. Two-thirds of women (65.8%) and over half of men (58.2%) were married or living with a partner at the time of the survey. (National Bureau of Statistics [Tanzania] & Macro International Inc., 2000).

Measures

The outcome measures for our analyses consist of dummy variables indicating whether the respondents discussed family planning with their partner, ever used a condom, and had used a condom in their last sex act (“yes” or “no” for each).

Our indicators of exposure to the various reproductive health campaigns are the following. First, exposure to the *Salama* social marketing campaign is measured as a count of the number of sources of exposure, ranging from 0 through 10. Exposure to the *Green Star* symbol is measured through a count of the number of sources of exposure, ranging from 0 through 7. Exposure to the reproductive health dramas (*Zinduka*, *Twende*

na Wakati, Geuza Mwendu, Ukimwi Kifo, Sema Naye, and Vijana wetu) is measured as a count of the number of radio dramas they recall listening to, ranging from 0 through 6. Our final indicator is a count of the total number of sources of exposure (including *Salama, Green Star*, and the radio dramas) and has a theoretical range from 0 through 23.

Our control variables include respondent age, highest level of education achieved (none, primary, secondary, or higher), type of place of residence (rural or urban), number of sexual partners in the previous 12 months, and perceived personal risk for HIV/AIDS (low, moderate, or high). To measure frequency of media exposure we use three dummy variables indicating whether the respondent listens to the radio at least weekly, watches television at least weekly, and reads the newspaper at least weekly (yes or no for each).

Statistical Methods

Bivariate analyses were performed to assess differences in reported exposure to social marketing and health communication activities. To control for self-selection and endogeneity, two-step regression models were used to analyze the influence of campaign exposure on the discussion of family planning in the previous year, the ever-use of condoms, and condom use at last sex (Bollen, Guilkey, & Mroz, 1995; Guilkey, Mroz, & Taylor, 1992).¹ First, we used a negative binomial regression to estimate coefficients to predict exposure to various types of reproductive health communication campaigns.²

¹ Self-selection occurs when program exposure is not random, but the result of an individual's choice, which may be influenced by several factors. Endogeneity refers to the problem that it is unknown whether program exposure influences the behavioral outcomes, or if the behavioral outcomes affected whether the individual was exposed to the program (Figueroa, Bertrand, & Kincaid, 2002).

² We first tested Poisson regression models, but goodness-of-fit tests indicated that the exposure variables did not resemble a Poisson process. Hence, we opted to use the negative binomial model, of which Poisson is a special case (StataCorp, 2001).

Specifically, we predicted exposure to radio dramas, *Salama* messages, *Green Star* messages, and any type of reproductive health messages. Next, we tested whether program exposure was endogenous by including both the observed program exposure and the estimated residual from the equation that estimated program exposure in logistic regression models predicting our three outcomes measures (discussion of family planning, ever-use of condoms, and condom use during last intercourse). The t test for the coefficient of the estimated error term tested the null hypothesis that program exposure was exogenous. Finally, the predicted level of exposure was used to predict the three dependent variables, which controls for the potential endogeneity of actual program exposure. The results are presented in the form of odds ratios, where an odds ratio less than 1 indicates a smaller likelihood of the outcome than the reference group, and an odds ratio greater than 1 indicates a larger likelihood of the outcome.

Study Limitations

As in most other studies, the measures of campaign recall and behavioral outcomes in this study were based on self-reported information that is subject to recall errors and reporting biases. The fact that the data were collected through personal interviews may have contributed to such biases. Recent studies indicate that audio computer-assisted self-interviews (audio-CASI) and other methods yield different estimates of levels for sensitive behaviors, but it remains unclear which data collection procedure is most accurate (Turner, Miller, & Rogers, 1997; Turner et al., 1998; Van de Wijgert, Padian, Shiboshi, & Turner, 2000; Mensch, Hewett, & Erulkar, 2001; Magnani et al., 2002). Furthermore, while the questionnaire inquired about recall of *Salama* messages from all sources, respondents may not have always identified a message or

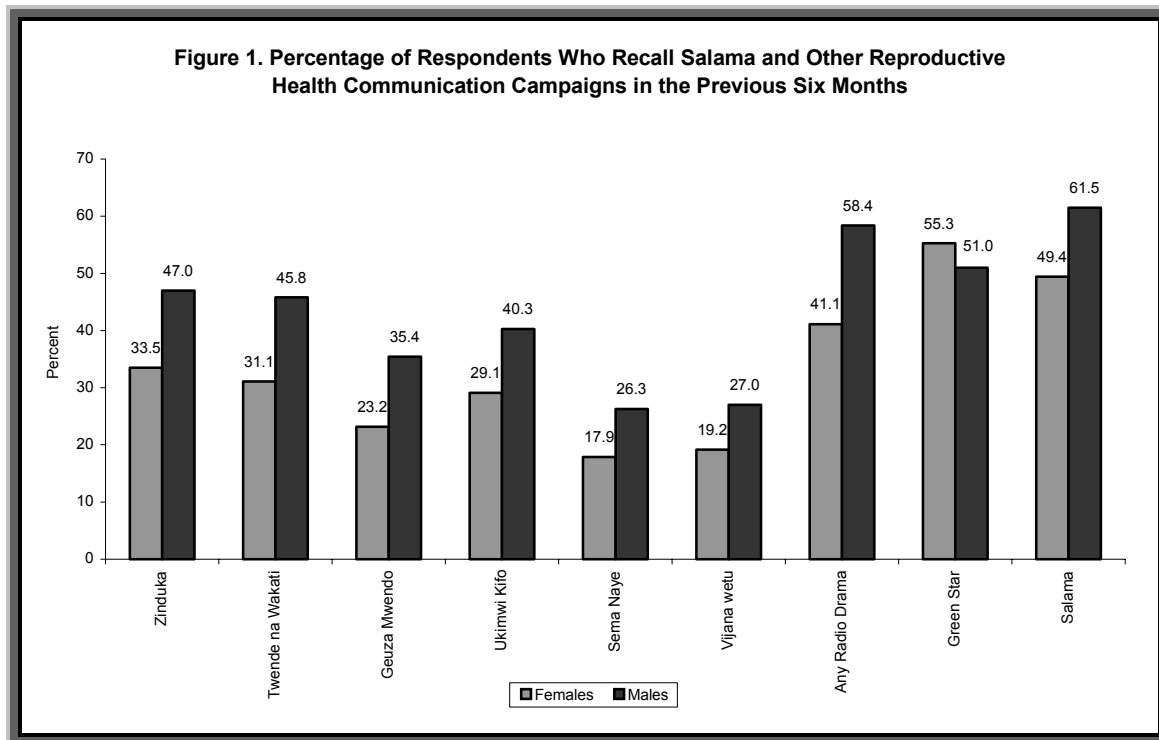
advertisements as being part of the *Salama* campaign.³ Similarly, our information about other health communication campaigns was restricted to the six main radio drama series and the *Green Star* campaign. Hence, our study is unable to measure the reach and impact of the total spectrum of health communication campaigns in Tanzania.

Results

Levels and Sources of Campaign Exposure

Figure 1 shows the percentage of females and males who reported recalling exposure to each of the six reproductive radio dramas in the six months prior to the survey, the percentage who had ever heard of *Green Star* family planning or seen the logo, and the percentage who recall hearing or seeing messages about *Salama* brand condoms in the previous six months. The results show that the reach of the reproductive health radio dramas is relatively high. Roughly 30% of females and 45% of males recall listening to the *Zinduka!*, *Twende na Wakati*, and *Ukimwi Kifo* radio dramas. The other three radio dramas had somewhat lower exposure. Overall, 41% of females and 58% of males recall hearing at least one of the six radio dramas in the six months prior to the survey. The *Green Star* family planning logo is known by 55% of females and 51% of males. Half of all females (49%) and nearly two-thirds of males (62%) recall seeing or hearing *Salama* messages in the previous six months.

³ However, the unbranded communication campaigns had not yet started at the time of the 1999 TRCHS.



For the *Green Star* and *Salama* campaigns, the survey also asked about the sources of exposure to the campaigns. Figure 2 shows the percentage of females and males who reported hearing messages about *Salama* from various sources. The results show that radio was the dominant source of information, followed by posters, billboards, and sales agents. One-third of women (33%) and nearly half of all males (48%) reported hearing *Salama* messages on the radio. *Salama* posters, which were the second most-cited source, were mentioned by only 10% of women and 16% of men. Figure 3 shows similar information for sources of exposure to the *Green Star* campaign. Again, radio was the main source of exposure, mentioned by 24% of women and 35% of men. However, for women, clinic signs and service providers were also very important sources of exposure to the *Green Star* campaign (29% and 21%, respectively). It is noteworthy that the level of exposure to radio messages about *Salama* and *Green Star* had roughly the same order of magnitude as exposure to the radio dramas.

Figure 2. Percentage of Respondents Exposed to Specific Sources of Information about Salama Condoms in the Previous Six Months

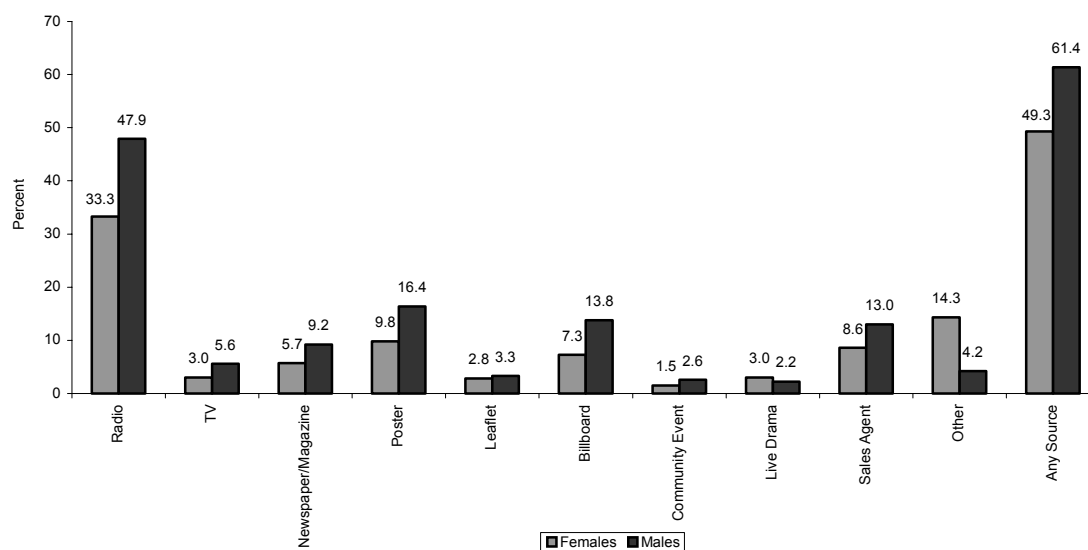
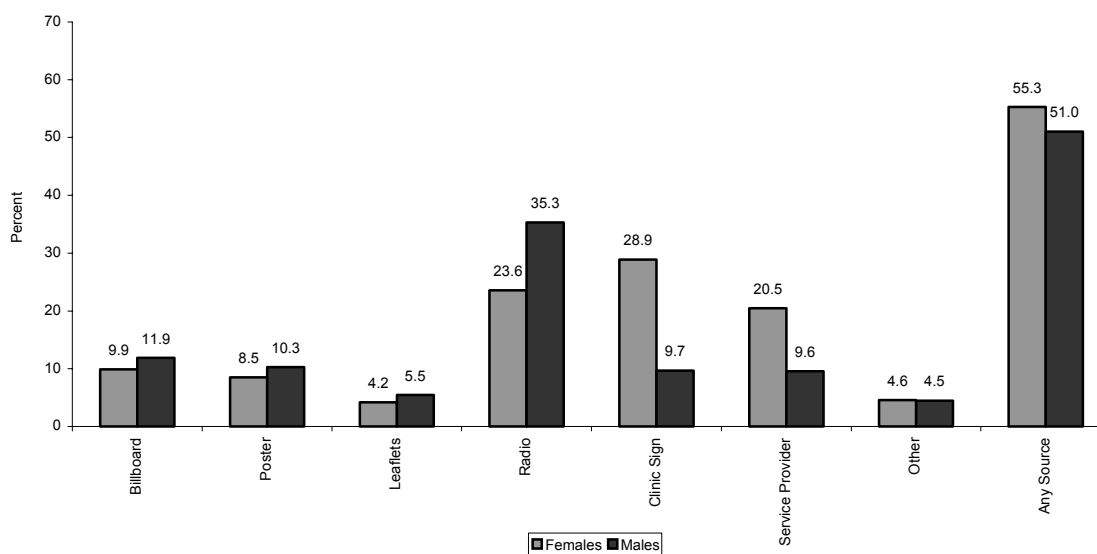


Figure 3. Percentage of Respondents Exposed to Specific Sources of Information about the Green Star National Family Planning Logo



Differentials in Levels of Campaign Exposure

We then assessed differentials in the level of exposure to social marketing communications and the other reproductive health communications. We also sought to determine the extent to which the *Salama* social marketing campaign and the other reproductive health campaigns are reaching different audiences. The results for females and males are shown in Tables 1A and 1B, respectively.

Table 1A shows that 30% of females did not recall being exposed to the *Salama* campaign or any of the six reproductive health dramas and were not familiar with the *Green Star* logo. Of the females, 7% were exposed only to the *Salama* social marketing campaign and 21% were exposed only to the other reproductive health campaign. The data also show that the *Salama* social marketing campaign and the other reproductive health communication campaigns generally affected the same target groups. More than four out of 10 women (42%) were exposed to both types of campaigns, which implies that this group will have more frequent exposure to reproductive health messages.

Breaking down the data by social and economic background variables shows that the likelihood of being exposed to both types of campaigns is greatest for women who had secondary or higher education (81%), lived in urban areas (71%), and had weekly exposure to radio (67%), television (78%), or newspapers (88%). Breaking down by number of sexual partners and perceived risk of HIV infection does not reveal any clear pattern.

Table 1A. Percentage of Females Reporting Recall of *Salama* and Other Reproductive Health Communication Campaigns

Communication Campaigns	Campaign Recall (Percent)				Unweighted Number of Cases
	Neither	Salama Only	Other Only	Both	
<i>Age</i>					
15–19	39.4	7.4	21.9	31.3	926
20–24	19.1	8.4	20.3	52.2	772
25–20	20.6	6.8	22.6	49.9	748
30–39	28.1	6.9	20.3	44.7	981
40–49	41.9	7.2	20.2	30.8	589
<i>Education</i>					
None	54.3	8.8	17.5	19.4	1025
Primary	21.5	7.0	23.4	48.0	2451
Secondary or Higher	4.7	4.2	9.8	81.4	540
<i>Place of Residence</i>					
Urban	8.8	5.1	15.2	71.0	1413
Rural	37.6	8.2	23.3	30.9	2603
<i>Number of Sex Partners in Previous 12 Months</i>					
None	43.5	8.1	25.7	22.7	595
1	27.2	7.4	21.0	44.3	2823
2	9.3	5.3	15.1	70.2	186
3 or more	37.5	8.7	6.7	47.1	63
<i>Perception of HIV Risk</i>					
Low	32.9	6.1	21.6	39.5	2422
Medium	18.5	6.9	19.3	55.3	537
High	21.5	8.3	21.9	48.4	435
Not Stated	32.8	10.7	20.4	36.2	622
<i>Listened to Radio Weekly</i>					
No	37.6	8.2	21.7	32.5	2650
Yes	8.3	5.0	19.7	67.1	1355
<i>Watched TV Weekly</i>					
No	30.6	7.4	21.6	40.4	3561
Yes	6.4	6.4	9.4	77.8	455
<i>Read Newspaper Weekly</i>					
No	31.0	7.6	21.9	39.5	3737
Yes	2.4	2.9	6.8	87.9	279
<i>Total</i>	29.5	7.3	21.1	42.1	4016

Table 1B. Percentage of Males Reporting Recall of *Salama* and Other Reproductive Health Communication Campaigns

Communication Campaigns	Campaign Recall (Percent)				Unweighted Number of Cases
	Neither	Salama Only	Other Only	Both	
<i>Age</i>					
15–19	33.1	9.1	16.4	41.4	799
20–24	16.7	9.8	10.4	63.1	550
25–29	14.7	9.2	12.5	63.6	529
30–39	14.7	8.7	15.7	60.9	817
40–59	29.5	8.0	20.8	41.6	840
<i>Education</i>					
None	46.2	13.5	16.3	24.0	479
Primary	20.2	8.3	16.4	55.0	2526
Secondary or Higher	4.0	6.4	7.6	82.0	522
<i>Place of Residence</i>					
Urban	7.4	5.9	9.8	76.9	1246
Rural	28.1	10.0	18.0	43.9	2289
<i>Number of Sex Partners in Previous 12 Months</i>					
None	47.5	9.2	17.9	25.4	565
1	23.4	8.3	15.6	52.8	1922
2	11.8	10.0	14.6	63.6	783
3 or more	8.3	4.8	14.3	72.6	66
<i>Perception of HIV Risk</i>					
Low	22.7	8.2	15.3	53.8	2431
Medium	16.1	9.1	13.2	61.6	475
High	16.4	8.6	21.2	53.9	244
Not Stated	33.6	12.1	18.3	36.0	385
<i>Listened to Radio Weekly</i>					
No	34.7	11.5	16.6	37.2	1788
Yes	8.2	5.7	14.9	71.2	1740
<i>Watched TV Weekly</i>					
No	24.3	9.0	16.4	50.3	2895
Yes	7.1	7.1	10.4	75.3	637
<i>Read Newspaper Weekly</i>					
No	25.5	9.4	16.7	48.4	2970
Yes	4.6	5.4	10.4	79.6	560
<i>Total</i>	22.6	8.9	15.8	52.7	3535

Table 1B shows the results for males. Nearly a quarter of males (23%) did not recall exposure to either type of campaign; 9% were exposed only to the *Salama* campaign, and 16% only to the other reproductive health communication campaigns. More than half of the males (53%) reported being exposed to both social marketing and other reproductive health communication campaigns. As was the case with females, the likelihood of being exposed to both campaign types was noticeably higher for educated and urban males, and for those who had high contact with radio, television, and newspapers. The percentage of men who were exposed to both campaign types also increased steadily with risky sexual behavior, ranging from 25% for those who had no sexual partners in the previous year to 73% for those with three or more partners.

The Effect of Campaign Exposure on Reproductive Health Behavior

We then measured the effect of social marketing and other reproductive health programs on the outcome measures. The results are shown in Tables 2–4. Each table shows the effects of the four types of program exposure: 1) *Salama* communications, 2) reproductive health radio dramas, 3) the *Green Star* family planning program, and 4) exposure to any type of reproductive health communications. For models where there was evidence of endogeneity (see Appendix B), we also show the effect of predicted exposure, which controls for endogeneity.

Table 2 shows the effect of *Salama* exposure on discussion of family planning for males and females. The first column shows the results of a simple one-step logistic regression model. The results for women indicate that *Salama* exposure had a significant effect, even after controlling for other factors. With each source of *Salama* exposure, the

relative odds of having discussed family planning with their partner increase by a factor of 1.28. After controlling for endogeneity, the effect of (predicted) *Salama* exposure on discussion of family planning remains highly significant and is in fact larger (OR=2.4). For males, the logistic regression of *Salama* program exposure is also significant (OR=1.5). Unlike for females, there is no evidence of endogeneity.

Table 2. Logistic Regression Estimates of the Impact of Predicted Reproductive Health Program Exposure on Discussion of Family Planning, by Program Type and Gender

	Type of Campaign							
	Salama (1)	(2)	Dramas (3)	(4)	Green Star (5)	(6)	Any RH Campaign (7)	(8)
Females								
Program Exposure	1.282***	2.440***	1.140***	--	1.459***	2.629***	1.129***	--
Age	1.046	1.024	1.048	--	1.040	0.983	1.049	--
Rural Residence	0.657***	1.170	0.662**	--	0.716**	1.315	0.752*	--
Primary Education	2.396***	1.695***	2.372***	--	2.219***	1.451*	2.223***	--
Secondary or Higher Education	4.506***	1.809	4.877***	--	4.588***	2.092*	4.235***	--
2+ Partners Previous Year	0.942	0.770	0.950	--	0.969	0.910	0.910	--
High HIV Risk Perception	0.772	0.724*	0.762	--	0.759	0.695**	0.756	--
Wants to Postpone Pregnancy	2.644***	2.672***	.825	--	2.578***	2.668***	2.659***	--
Condom Source Unknown	0.508***	0.448***	0.483***	--	0.549***	.0446***	0.556***	--
Islamic	0.860	0.896	0.825	--	0.768**	0.897	0.770**	--
Log Likelihood	-1453.8	-1448.8	-1449.9	--	-1436.9	-1451.2	-1436.1	--
Number of Cases	2,451	2,444	2,451	--	2,451	2,444	2,451	--
Males								
Program Exposure	1.521***	--	1.187***	--	1.359***	--	1.165***	--
Age	1.026	--	1.006	--	1.006	--	1.014	--
Rural Residence	1.277	--	1.032	--	1.117	--	1.267	--
Primary Education	2.263***	--	2.231***	--	2.299***	--	2.056***	--
Secondary or Higher Education	4.596***	--	5.678***	--	5.310***	--	4.442***	--
2+ Partners Previous Year	0.896	--	0.902	--	0.925	--	0.873	--
High HIV Risk Perception	0.803	--	0.782	--	0.757	--	0.797	--
Wants to Postpone Pregnancy	--	--	--	--	--	--	--	--
Condom Source Unknown	0.441*	--	0.408***	--	0.394***	--	0.477***	--
Islamic	0.938	--	0.885	--	0.879	--	0.859	--
Log Likelihood	-1173.6	--	-1181.2	--	-1192.7	--	-1163.0	--
Number of Cases	1,929	--	1,929	--	1,929	--	1,929	--

* p<0.10

** p<0.05

*** p<0.01

Note: Even-numbered models show the effect of predicted program exposure, rather than actual program exposure, which controls for endogeneity.

Model 3 in Table 2 shows that exposure to reproductive health radio dramas had a significant and positive effect on discussion of family planning for both females and males (OR=1.14 and 1.19, respectively). Model 5 shows that *Green Star* exposure also increased the likelihood that women had discussed family planning with their partner (OR=1.46). After controlling for endogeneity, this effect increases (OR=2.63). The bottom panel confirms that *Green Star* exposure also increased the likelihood that men had discussed family planning with their partner (OR=1.36). Finally, Model 7 shows that exposure to any to the above reproductive health programs increased the likelihood of having discussed family planning, for both females and males (OR=1.13 and 1.17, respectively).

Table 3 shows the results for the effect of program exposure on the likelihood that a respondent ever used condoms. Model 1 shows that exposure to *Salama* messages significantly increases both female (OR=1.29) and male (OR=1.32) likelihood of ever having used condoms. For males, the odds ratio increased to 1.70 after controlling for endogeneity (see Model 2). Exposure to reproductive health radio dramas also had a significant effect on both genders' likelihood of ever having used condoms (OR=1.09 for women and 1.12 for men). Similarly, Model 5 shows that exposure to *Green Star* communications was associated with a significantly higher likelihood for both females and males of ever having used condoms (OR=1.24 and 1.25, respectively). After controlling for endogeneity, the effect for males increased to 1.76 ($p<.05$). Our combined indicator of exposure to the three types of reproductive health communications also shows a significant effect for both genders.

Table 3. Logistic Regression Estimates of the Impact of Predicted Reproductive Health Program Exposure on Ever Having Used Condoms, by Program Type and Gender

	Type of Campaign							
	Salama (1)	(2)	Dramas (3)	(4)	Green Star (5)	(6)	Any RH Campaign (7)	(8)
Females								
Program Exposure	1.285***	--	1.093**	--	1.235***	--	1.092***	--
Age	0.990	--	0.991	--	0.975	--	0.981	--
Rural Residence	0.801	--	0.741	--	0.783	--	0.844	--
Primary Education	1.500	--	1.548	--	1.513	--	1.440	--
Secondary or Higher Education	2.610***	--	3.060***	--	2.980***	--	2.601***	--
2+ Partners Previous Year	6.166***	--	6.372***	--	6.548***	--	6.278***	--
High HIV Risk Perception	0.391***	--	0.380***	--	0.390***	--	0.384***	--
Wants to Postpone Pregnancy	1.030	--	1.034	--	1.020	--	1.020	--
Condom Source Unknown	0.225***	--	0.200***	--	0.216***	--	0.229***	--
Islamic	0.680*	--	0.673**	--	0.656**	--	0.650**	--
Log Likelihood	-871.6	--	-879.0	--	-876.4	--	-871.9	--
Number of Cases	3,667	--	3,667	--	3,667	--	3,667	--
Males								
Program Exposure	1.319***	1.695***	1.117***	--	1.245***	1.762**	1.111***	--
Age	0.820***	0.825***	0.815***	--	0.812***	0.804***	0.809***	--
Rural Residence	0.649***	0.872	0.540***	--	0.596***	0.799	0.613***	--
Primary Education	1.613*	1.322	1.702**	--	1.702**	1.384	1.524	--
Secondary or Higher Education	2.158**	1.407	2.570***	--	2.429***	1.604	2.060**	--
2+ Partners Past Year	4.118***	3.374***	4.150***	--	4.159***	3.659***	4.131***	--
High HIV Risk Perception	0.540***	0.590**	0.524***	--	0.527***	0.537***	0.536***	--
Wants to Postpone Pregnancy	--	--	--	--	--	--	--	--
Condom Source Unknown	0.069***	0.056***	0.063***	--	0.061***	0.055***	0.074***	--
Islamic	0.893	0.912	0.881	--	0.882	0.912	0.535***	--
Log Likelihood	-1312.9	-1336.1	-1333.9	--	-1334.2	-1318.9	-1318.9	--
Number of Cases	3,318	3,318	3,328	--	3,328	3,328	3,328	--

* p<0.10

** p<0.05

*** p<0.01

Note: Even-numbered models show the effect of predicted program exposure, rather than actual program exposure, which controls for endogeneity.

The effect of program exposure on condom use in last intercourse is shown in Table 4. Exposure to *Salama* communications had a significant positive effect on condom use in last sex for both females and males (OR=1.23 and 1.35, respectively). By contrast, exposure to the radio dramas and to *Green Star* communications only had an effect on condom use in last sex for males (OR=1.13 for dramas and 1.23 for *Green Star*).

Analyzing the effect of all reproductive health communication activities combined shows a significant positive effect on condom use in last intercourse for both females and males (OR=1.07 and 1.12, respectively).

Table 4. Logistic Regression Estimates of the Impact of Predicted Reproductive Health Program Exposure on Condom Use in Last Intercourse, by Program Type and Gender

	Type of Campaign							
	Salama (1)	(2)	Dramas (3)	(4)	Green Star (5)	(6)	Any RH Campaign (7)	(8)
Females								
Program Exposure	1.231***	--	1.056	--	1.158*	--	1.066**	--
Age	0.883**	--	0.882**	--	0.874**	--	0.877**	--
Rural Residence	0.588**	--	0.534***	--	0.561**	--	0.600**	--
Primary Education	1.639	--	1.712*	--	1.668	--	1.612	--
Secondary or Higher Education	2.930***	--	3.473***	--	3.354***	--	3.019***	--
2+ Partners Previous Year	1.947**	--	2.027**	--	2.084**	--	1.999**	--
High HIV Risk Perception	0.370***	--	0.366**	--	0.369***	--	0.366**	--
Wants to Postpone Pregnancy	0.875	--	0.874	--	0.868	--	0.871	--
Condom Source Unknown	0.252***	--	0.227***	--	0.240***	--	0.251***	--
Islamic	0.573**	--	0.574**	--	0.562**	--	0.561**	--
Log Likelihood	-721.6	--	-727.3	--	-725.7	--	-723.6	--
Number of Cases	3,065	--	3,065	--	3,065	--	3,065	--
Males								
Program Exposure	1.348***	--	1.133***	--	1.226***	--	1.121***	--
Age	0.719***	--	0.718***	--	0.716***	--	0.712***	--
Rural Residence	0.714**	--	0.585***	--	0.644**	--	0.672**	--
Primary Education	1.693	--	1.787	--	1.836*	--	1.597	--
Secondary or Higher Education	2.288**	--	2.692**	--	2.681**	--	2.163*	--
2+ Partners Previous Year	1.208	--	1.228	--	1.235	--	1.222	--
High HIV Risk Perception	0.575*	--	0.554**	--	0.562**	--	0.573**	--
Wants to Postpone Pregnancy	--	--	--	--	--	--	--	--
Condom Source Unknown	0.085***	--	0.078***	--	0.073***	--	0.093***	--
Islamic	1.182	--	1.170	--	1.171	--	1.142	--
Log Likelihood	-982.6	--	-993.9	--	-997.5	--	-981.9	--
N of Cases	2,709	--	2,709	--	2,709	--	2,709	--

* p<0.10

** p<0.05

*** p<0.01

Note: Even-numbered models show the effect of predicted program exposure, rather than actual program exposure, which controls for endogeneity.

Conclusions

In response to the growing importance of social marketing and health communication programs, large-scale survey programs such as the Demographic and Health Surveys have started to include questions on such programs in selected countries. Using the 1999 Tanzania Reproductive and Child Health Survey, this paper investigates the reach of selected social marketing and health communication activities in Tanzania and assesses their impact on discussion of family planning and on condom use. We specifically examine the reach and impact of communications regarding *Salama* socially marketed condoms, of six radio dramas on reproductive health, and of communications for the *Green Star* family planning program.

Our analysis shows that the reach of the communication campaigns was quite high. Overall, 41% of females and 58% of males recall hearing at least one of the six radio dramas in the six months before the survey. The *Green Star* national family planning campaign is known by 55% of females and 51% of males. Half of all females (49%) and nearly two thirds of males (62%) recall seeing or hearing *Salama* messages in the previous six months. Radio is the single most important source of exposure for both *Salama* and *Green Star* communications. However, for women, clinic signs and service providers are also important sources of exposure for the *Green Star* family planning campaign. Exposure to various reproductive health campaigns appears to increase sharply with level of education, urban residence, and with the respondents' level of exposure to radio, television, and newspapers. The results also show that it is uncommon for people to be exposed to *Salama* communications without also being exposed to any other

reproductive health campaigns. This implies that the campaigns are generally reaching the same target group, thereby supplementing and reinforcing the messages.

Estimates of the impacts of campaign exposure show that exposure to the *Salama* campaign, the reproductive health radio dramas, and the *Green Star* campaign increased discussion of family planning and the likelihood of ever having used condoms for both women and men. Controlling for endogeneity, when present, typically increased the magnitude of these effects. The effect on condom use in last intercourse varied by gender. Among men, exposure to each of the campaigns increased the likelihood that a condom was used in last intercourse. However, among females only exposure to the *Salama* social marketing campaign had a significant effect. It is noteworthy that exposure to the radio dramas and *Green Star* increased female likelihood of ever having used condoms, but not condom use in last sex.

In conclusion, the evidence shows that social marketing and other reproductive health communications campaigns succeeded in reaching a substantial portion of the target population. However, future campaigns need to improve efforts to reach rural, less-educated, and low socio-economic status populations. The results further indicate that exposure to these campaigns had a strong positive effect on reproductive health behavior, even after controlling for other factors. As this effect increased with level of exposure, it is important for future campaigns to increase the number of channels through which they disseminate campaign messages and to increase the frequency of such messages.

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